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10/804,152	03/19/2004	Kiril A. Pandelisev	PHOENIX	6403

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EXAMINER

NGUYEN, THUKHANH T

ART UNIT

PAPER NUMBER

1722

DATE MAILED: 08/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of claim 409 in the reply filed on May 31, 2006 is acknowledged. The traversal is on the ground(s) that the Applicant believes that it would not be unduly burdensome for the Examiner to search the method claim. This is not found persuasive because of applicants' allegation that joiner of these distinct inventions would not present a serious burden to the U. S. Patent and Trademark Office. This allegation relied on the unsupported assumption that the search and examination of both inventions would be coextensive. However, the issues raised in the examination of a wafer boat and a process for fabricating wafer boat preform claims are divergent from those raised in the examination of process for making an electronic chip claims. Further, while there may be some overlap in the searches of the two inventions, there is no reason to believe that the searches would be identical. Therefore, based on the additional work involved in searching and examining both distinct inventions together, restriction of the distinct inventions is clearly proper.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 389-396, 399-401, 405 are rejected under 35 U.S.C. 102(b) as being anticipated by Alliegro et al (3,951,587).

Alliegro et al teach a method for forming tube, paddle and boat for semi-conductor wafer, comprising the step of:

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1) selecting silicon or silicon carbide powder (col. 2, lines 33-36, claims 389, 393, 395, 399, 405); wherein the material could be pure silicon, or a combination of silicon and silicon carbide matrix containing 5 to 30% by weight of silicon carbide which is equivalent to the range of $0 < x < 1$ (col. 6, lines 19-23);

2) presinter heating (col. 4, lines 4-6, claims 392, 404),

3) forming the wafer boat by cold-pressing, isostatic pressing, extrusion, or slip casting (col. 4, lines 22-25; claims 390, 394, 400), then cooling the material down in order to remove the boat from the mold (col. 2, lines 21-27); and

4) mixing the silicon carbide with other organic or inorganic compound (col. 5, lines 29-35; claims 391, 396, 401);

5) machining and cutting the wafer boat (col. 4, lines 8-11) and coating the wafer boat with silicon material (col. 3, lines 20-22; claims 406-407).

4. Claims 389, 392-393, 399-400, and 404-408 are rejected under 35 U.S.C. 102(b) as being anticipated by Sibley (5,776,391).

Sibley teaches a method for forming silicon carbide carrier, comprising the step of selecting silicon or silicon carbide material (col. 2, lines 58-62; col. 3, lines 1-4; or col. 7, lines 3-5), purifying the mold with the inner gas in a purification reactor (col. 8, lines 30-32), depositing a plurality of silicon/silicon carbide layers in a mold (col. 7, lines 22-23), coating the silicon carbide boat by a CVD method (col. 7, lines 28-31), wherein the forming boat is cut longitudinally along the axes to form two boats (col. 7, lines 22-24), further finishing processes

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such as forming the slots or to reduce the boats to the desired dimension (col. 7, lines 51 to col. 8, lines 2).

5. Claims 389-396, 399-402, and 404-405 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakayama et al (5,942,454).

Nakayama et al disclose a method for sintering silicon carbide wafer boats, comprising the steps of:

- a. selecting silicon or silicon carbide powder and mixing the silicon carbide powder with other organic or inorganic compounds (col. 3, lines 23-24 and lines 51-56), wherein the silicon carbide powder contains aluminum, iron, and calcium; thus, the silicon compound would have the x value of $0 < x < 1$;
- b. extruding the silicon material into a mold (col. 3, lines 24-25),
- c. vacuum sintering or purging or purifying the mold prior to sintering the wafer boat (col. 3, lines 38-41),
- d. sintering the silicon carbide material at high temperature (col. 3, lines 41-43),
- e. coating the silicon carbide wafer boat by CVD process (col. 3, lines 56-58),

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 397-398, 402-403 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alliegro et al ('587), Sibley ('391) or Nakayama et al ('454) as applied to claims 389-396, 399-401, and 405 above, and further in view of Moritoki et al (4,620,839).

Alliegro et al, Sibley and Nakayama et al disclose that the silicon carbide wafer boat was formed by a deposition, pressing, sintering, or isostatic pressing. However, these references fail to disclose that the silicon carbide material in a vacuum chamber or that the pressing is done by a gas pressure.

Moritoki et al disclose a method and apparatus for forming silicon carbide in a high temperature and high pressure isostatic molding chamber or HIP using an inert gas as a pressurizing medium (col. 28-32).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify Alliegro et al, Sibley and Nakayama et al by improving the forming of the silicon carbide boats by providing an inert gas in a pressing chamber as a pressurizing medium as taught by Moritoki et al because the gas pressurizing medium would be more gentle on the forming material than other mechanical pressing means.

Response to Arguments

8. Applicant's arguments filed May 31, 2006 have been fully considered but they are not persuasive. The applicant discloses that the prior art fails to disclose the specific composition as claimed. The examiner respectfully disagrees. The claims requires that the wafer boat preform is formed selectively from the group of silicon or silicon compounds. Alliegro ('587) discloses that the wafer boat is made of silicon or silicon carbide (col. 2, lines 32-36); Sibley ('391)

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discloses that the wafer carrier is made by depositing CVD silicon or silicon carbide (col. 2, lines 59-62); Nakayama ('454) discloses that the wafer boars can be made by silicon (col. 3, lines 51-55) or silicon carbide (col. 3, lines 59-63). In case of silicon carbide, Silicon is impregnating at different ratio, thus result in x value less than 1 and greater than 0 (col. 2, lines 14-51).

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thu Khanh T. Nguyen whose telephone number is 571-272-1136. The examiner can normally be reached on Monday- Friday, 6:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gupta Yogendra can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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TN


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